UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,333	10/20/2003	Jian Chen	SAND-01012US0	4179

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EXAMINER
LE, THONG QUOC

ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-57_ is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _46-57_ is/are allowed.

6)☒ Claim(s) _1-5, 12-13-17, 20-27, 29-32, 34-38, 40-41, 44-45_ is/are rejected.

7)☒ Claim(s) _6-11, 18, 19, 28, 33, 39, 42 and 43_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
     Paper No(s)/Mail Date _5/09/2005_.

4)☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1. Amendment filed on August 01, 2005 has been entered.

2. Claims 1-57 are presented for examination.

Information Disclosure Statement

3. This office acknowledges receipt of the following items from the Applicant:

Information Disclosure Statement (IDS) filed on 05/09/2005.

4. Information disclosed and list on PTO 1449 was considered.

Response to Arguments

5. Applicant's arguments with respect to claims 1-57 have been considered but are

moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act

of 1999 (AIPA) and the Intellectual Property and High Technology Technical

Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior

to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7.   Claims 1-5, 12-13-17,20-27,29-32,34-38,40-41,44-45 are rejected under 35

U.S.C. 102(e) as being anticipated by Masui et al. (U.S. Patent No. 6,924,663).

        Regarding claims 1-5, 12-13, Masui et al. disclose a method for programming

non-volatile memory (Figure 1) , comprising: categorizing a set of non-volatile storage

elements into three or more groups (Figure1, Column 1, lines 35-45) based on a

detected behavior of said non-volatile storage elements; and programming said non-

volatile storage elements using a different programming condition for each group

(Column 1, lines 45-67, Column 2, lines 1-25, Figure 1), and wherein: said step of

programming includes applying different bit line voltages for different groups, and

wherein said step of programming includes applying a program signal to said non-

volatile storage elements via a common word line and applying different bit line voltages

for different groups, and wherein said step of categorizing includes determining

programming speed information of said non-volatile storage elements relative to each

other, each group including non-volatile storage elements with similar programming

speed information (Column 1, lines 22-67, Column 2, lines 1-9), and and the step of

categorizing includes determining programmability of the non-volatile storage elements

relative to each other, each group including non-volatile storage elements with similar

programmability (Column 1, lines 35-45), and the non-volatile storage elements are

multi-state NAND flash memory elements (Column 1, lines 45-60),

Regarding claims 14-17,20-27,29-32,34-38,40-41,44-45, Masui et al. disclose a

system for programming non-volatile memory (Figure 1), comprising a set of non-

volatile storage elements (4,5,6), a set of control lines (CONTROL SIGNALS) in

communication with said set of non-volatile storage elements (Figure 1)`, and a

controlling circuit (figure 3, 22) in communication with said control lines, said controlling

circuit causes a categorizing of said set of non-volatile storage elements into three or

more groups based on a detected behavior of said non-volatile storage elements and

causes programming of said non-volatile storage elements using a different

programming condition for each group (Column 1, lines 21-67, Column 2, lines 16), and

wherein: said control lines includes a set of bit lines (Figure 6, BL) and a common word

line (Figure 6, WL(x); said controlling circuit causes application of a program signal on

said common word line; and said different program condition for each group pertains to

different bit line voltages (Figure 8), and wherein said categorizing includes determining

programming speed information of said non- volatile storage elements relative to each

other, each group including non-volatile storage elements with similar speed

information, and wherein said categorizing includes determining programmability of said

non-volatile storage elements relative to each other, each group including non-volatile

storage elements with similar speed information (Column 1, lines 35-67), and wherein

said controller circuit causes initial programming to said non-volatile storage elements

prior to said programming said non-volatile storage elements using a different

programming condition (Column 6, lines 8-62), and , said categorizing is based on said

initial programming (Column 8, lines 12-21), and wherein: said initial programming is

performed until at least one non-volatile storage element reaches a target threshold value (Column 6, lines 50-67), and said categorizing is performed for non-volatile storage elements that did not yet reach said target threshold value (Column 6, lines 50-67), and wherein: said initial programming is performed using a common word line signal (WL(x)), and wherein: said non-volatile storage elements are multi-state storage elements, and wherein: said non-volatile storage elements are multi-state NAND flash memory elements (Column 1, lines 45-59).

Allowable Subject Matter

8.   Claims 6-11,18-19,28,33,39,42-43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-13 include allowable subject matter since the prior art made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Masui et al. (U.S. Patent No. 6,924,663), and others, does not teach the claimed invention having a step of categorizing includes applying one or more non-zero source voltages to said set of non-volatile storage elements and, while applying said one or more non-zero source voltages, characterizing threshold voltages of said set of non-volatile storage elements by applying one or more positive voltages to control gates for said non-volatile storage elements and determining whether said non-volatile storage elements turn on in order to determine whether said non-volatile storage elements have a threshold voltage greater than a negative voltage compare point.

9.   Claims 46-57 are allowed.

Claims 46-57 include allowable subject matter since the prior art made of record

and considered pertinent to the applicant's disclosure does not teach or suggest the

claimed limitations. Masui et al. (U.S. Patent No. 6,924,663), and others, does not teach

the claimed invention having while applying said one or more non-zero source voltages,

·characterizing threshold voltages of said set of non-volatile storage elements by

applying one or more positive voltages to control gates for said non-volatile storage

elements and determining whether said non-volatile storage elements turn-on in order

to determine whether said non-volatile storage elements have a threshold voltage

greater than a compare point; and adjusting a programming parameter of at least a

subset of said non-volatile storage elements based on said step of characterizing.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Thong Q. Le whose telephone number is 571-272-1783.

The examiner can normally be reached on 8:00am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hoai V. Ho can be reached on 571-272-1777. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Thong Q. Le
Primary Examiner
Art Unit 2827